

ABSTRACT

It is aimed at decreasing losses not only in a synchronous rectifier circuit provided at a secondary side of a DC-DC converter, but also in a full-bridge switching circuit provided at a primary side thereof. The DC-DC converter comprises a transformer for voltage conversion, a synchronous rectifier circuit at the secondary side, and a full-bridge switching circuit at the primary side. The DC-DC converter performs synchronous rectifier control which uses switch transistors to change paths of currents flowing through the secondary coil in synchronization with switching operations at the primary side. The DC-DC converter detects currents flowing through a load at the secondary side, primary-side currents varying with the load currents, or primary-side input voltages to dynamically control off-timings of a synchronous rectification transistor at the secondary side. In addition, the DC-DC converter detects primary-side input voltages and currents flowing through the secondary-side load to dynamically control on-timings of a transistor in the primary-side switching circuit.